the succeeding nine months and the patient continued to be disabled for manual labor.

SUMMARY

Isolated paralysis of the serratus anterior muscle occurred in a patient following electrical shock from a 110-volt drill he was holding in his right hand and could not release when the current passed through his body.

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A Perineo-Abdominal Approach for Resection of a Presacral Tumor

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THIS CLINICAL REPORT will illustrate and discuss two aspects of the treatment of a tumor in the presacral region: (1) A combined perineal and abdominal operation exposed most of the tumor and allowed the surgeon to resect it with its investing condensations of soft tissue, all the while maintaining precise hemostasis. (2) In this patient, resection of the right third, fourth, and fifth, and the left fourth and fifth sacral nerves caused no defects of reproductive function, micturition or defecation.

Adequate data and discussion concerning the incidence, the distribution and the histopathologic features of presacral tumors are already a part of the literature.[3,6,8] Several investigators reported successful resections by perineal and transsacral routes.[1,4,7] However, the combined abdominoperineal operation[2] has received much less attention. In the present case the tumor arose in the sacral neural canal and extended anteriorly to form a large mass behind and alongside the rectum. The tumor was supplied by several large arteries and drained by large veins belonging to the internal iliac system, which entered the mass on its cephalic and ventral surfaces. We feared that a resection attempted through a perineal route alone would cause hemorrhage difficult to control. On the other hand, an abdominal operation alone would not have permitted resection of that portion of the sacrum which was invaded by the tumor. In the combined perineo-abdominal operation, the surgeon exposed and removed as much of the sacrum as he considered necessary to rid it of tumor before he delivered the tumor into the presacral space. Then he removed the mass by careful abdominal dissection of all of its surfaces rather than by enucleating it from within its own outer layers.

Neuro-anatomic evidence suggests that sacrifice of certain segments of the pudendal plexus, formed by the anterior branches of the first through the fifth sacral nerves, will lead to loss of visceromotor functions. The visceral branches lie more in the third and fourth than in the second segments, and they include visceral afferent and preganglionic—that is, parasympathetic efferent—fibers. They participate with fibers from the hypogastric plexus and with visceral branches of the sacral chain ganglia in the formation of the pelvic plexus which distributes to the various pelvic organs. However, MacCarty and coworkers[6] and Mixter and Mixter[5] showed that, contrary to the fears of the anatomists, resection of the third, fourth and fifth sacral nerves bilaterally led to no observable dysfunction. Our experience corroborates that report.

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REPORT OF A CASE

The patient, a 28-year-old white man, had no symptoms referable to the tumor. He fell while at work and sought medical attention because he had pain in the back. A defect in the sacrum was noted in roentgenograms taken to determine the presence or absence of fractures (Figure 1). Upon examination a large, round, nontender, rubbery-firm mass was felt through the rectum in the presacral region. For biopsy, the tumor was exposed through a small

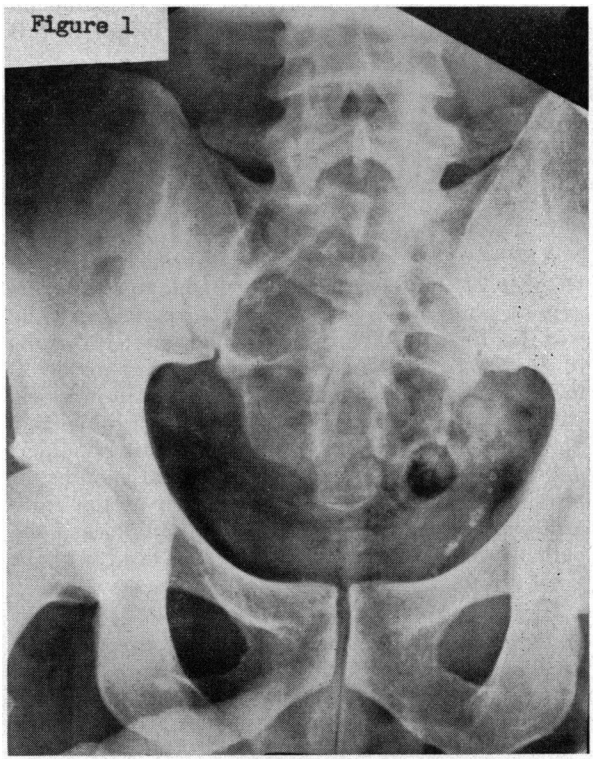

Figure 1.—Preoperative roentgenogram showing destruction of sacrum.

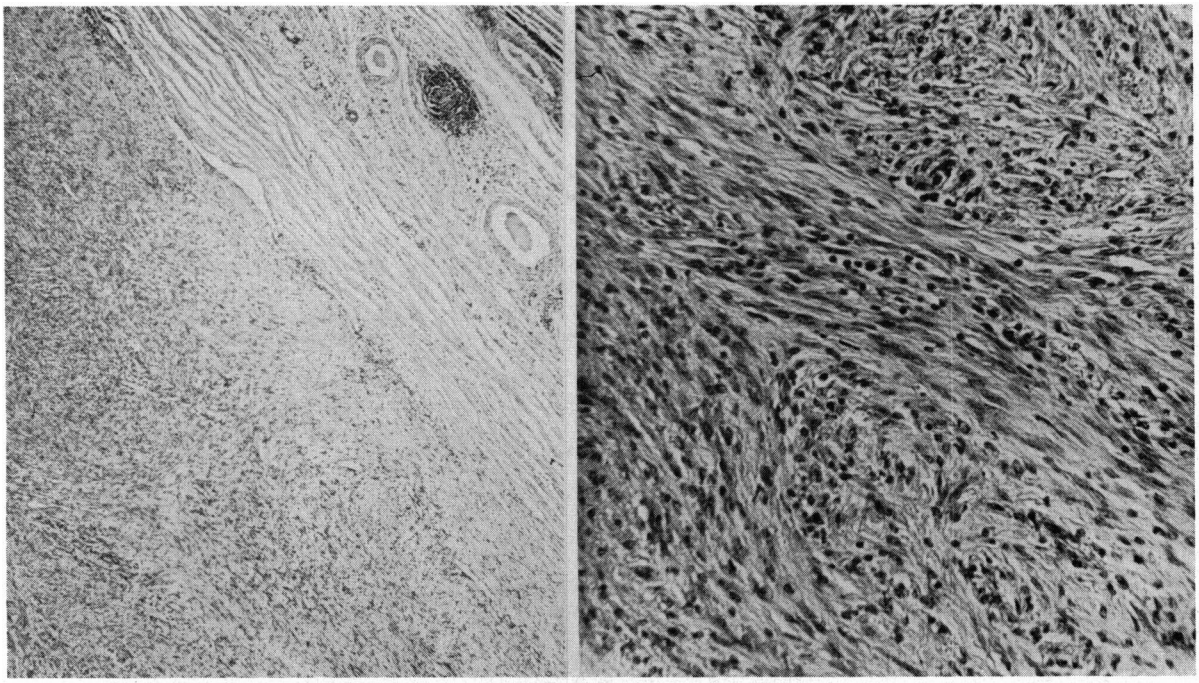

Figure 2.—Photomicrographs of specimen of lesion. *Left:* (×100), *Right:* (×400). Diagnosis: Locally destructive cellular neurofibrosarcoma.

incision over the right side of the posterior surface of the sacrum. A very thin layer of bone, representing the eroded roof of the neural canal, was elevated and a small portion of the tumor, which was fleshy, grey and vascular, was removed. The pathologist's diagnosis was neurofibroma. Subsequently, an operation for resection was performed. With the patient prone, a long right parasagittal incision was carried to the bone. By resecting the coccyx and reflecting the rectum, the surgeon exposed the presacral space. He transected the sacrum, crossing the third foramen on the right side, and divided the main trunks of the right third, fourth and fifth nerves, and the fourth and fifth on the left. The tumor was displaced entirely into the presacral space, drains and loose packing were inserted, and the incision was closed. The patient then was turned over and a lower midline incision was made in the abdomen. Retroperitoneal dissection beneath the pelvic floor delivered the tumor. A moderate amount of bleeding was controlled by ligation of the right internal iliac artery. The patient recovered promptly and was discharged from the hospital on the ninth postoperative day.

Pathologist's Report

The specimen was an oval mass approximately 10 cm. long and 7 cm. in diameter. One edge was irregular and contained several nerve trunks. Microscopically, the tumor was composed of columns of spindle-shaped cells. The cytoplasm was abundant and eosinophilic, and the nuclei were slightly irregular. Occasional cells were vacuolated. Mitosis was not readily found. A definite whorl pattern was present. Diagnosis: Locally destructive cellular neurofibroma. A low grade sarcomatous process cannot be excluded (see Figure 2).

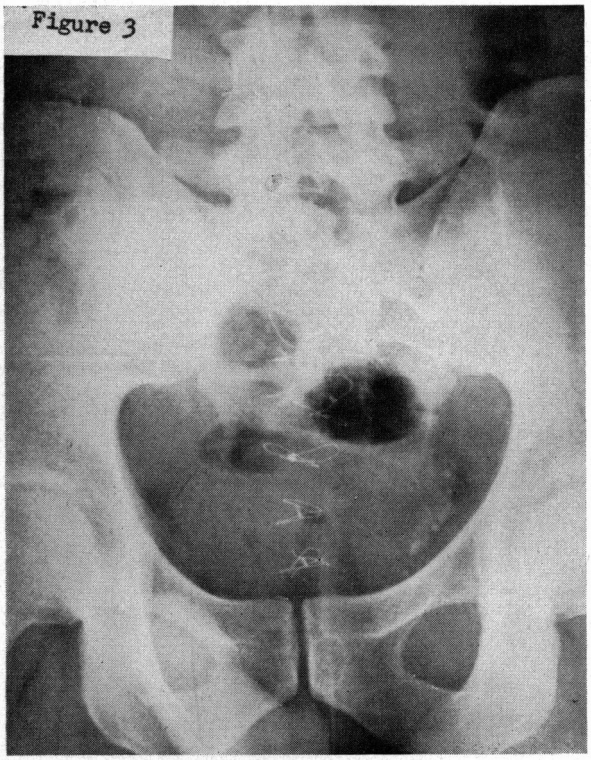

Figure 3.—Roentgenogram one year postoperative, showing residual defect of sacrum. Note: No enlargement right second sacral foramen.

When reexamined 12 months after the operation, the patient was well, without evidence of recurrence of disease, and without neurologic deficit other than some cutaneous numbness in a small zone in the saddle area. The sacral bony defect transmitted a cough impulse through soft tissues, but there was no hernial bulge. Figure 3 is a roentgenogram of the sacrum a year after the operation.

SUMMARY

A perineo-abdominal operation provided excellent exposure for a radical resection of a large tumor of the presacral region. The patient, a young man, had no visceral impairment after loss of five lower sacral nerves.

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